WHAT IS CLAIMED IS:

1. A demodulator comprising:

(a) a quadrature controller fed with a signal quadrature-detected by a quadrature detecting unit as an input signal to correct a quadrature error between phases of an in-phase component and a quadrature component of said signal based on a quadrature error signal used for correcting said quadrature error to output a corrected signal;

(b) an error detection unit detecting an error signal between the in-phase component and the quadrature component of a demodulated signal output by an automatic gain controller fed with an output signal of said quadrature controller corrected for quadrature error; and

(c) a quadrature error detection unit detecting the quadrature error based on said error signal to feed the quadrature error signal to said quadrature controller.

2. A demodulator comprising:

(a) a quadrature detecting unit fed with and quadrature-detecting a quadrature modulated signal to output an in-phase component and a quadrature component;

(b) a quadrature controller fed with the in-phase component and the quadrature component output from said quadrature detecting unit, said quadrature controller correcting the quadrature error between the in-phase component and the quadrature component based on an input quadrature error signal, and

outputting the resulting signal;

(c) an automatic gain controller fed with the in-phase component and the quadrature component output from said quadrature controller and outputting signals corrected for amplitude errors based on the input amplitude error signal as the in-phase component and the quadrature component of a demodulated signal;

(d) an error detection unit detecting, from the in-phase component and the quadrature component of the demodulated signal output from said automatic gain controller, an in-phase component of said error signal and a polarity signal of the in-phase component of the demodulated signal, and a quadrature component of the error signal and a polarity signal of the quadrature component of said demodulated signal;

(e) an amplitude error detection unit generating an in-phase component and a quadrature component of an amplitude error signal based on the in-phase component of said error signal output from said error detection unit and the polarity signal of the in-phase component of the demodulated signal, and on the quadrature component of the error signal and the polarity signal of the quadrature component of said demodulated signal, to output the generated in-phase and quadrature components of said amplitude error signal to said automatic gain controller; and

(f) a quadrature error detection unit generating a quadrature error signal based on the in-phase component of the error signal

and the polarity signal of the in-phase component of said demodulated signal, both output from said error detection unit, and on the in-phase component of said error signal and the polarity signal of the quadrature component of said demodulated signal to feed the generated quadrature error signal to said quadrature controller.

3. A demodulator comprising:

(a) an quadrature detecting unit fed with a quadrature modulated signal as an input signal to quadrature-detect the input signal to output in-phase and quadrature components of a regular amplitude;

(b) a quadrature controller fed with the in-phase and quadrature components output from the quadrature detection unit to correct the quadrature error between phases of the in-phase and quadrature components, based a quadrature error signal;

(c) an automatic gain controller fed with the in-phase and quadrature components output from said quadrature controller to output signals corrected for respective amplitude errors as in-phase and quadrature components of a demodulated signal;

(d) an error detection unit detecting an in-phase component of an error signal and a polarity signal of the in-phase component of the demodulated signal, and a quadrature component of the error signal and a polarity signal of the quadrature component of the demodulated signal, from the in-phase and quadrature components of the demodulated signal output from the automatic

gain controller; and

(e) a quadrature error detection unit generating a quadrature error signal based on the in-phase component of the error signal and the polarity signal of the in-phase component of the demodulated signal, and the quadrature component of the error signal and a polarity signal of the quadrature component of the demodulated signal, all output from said error detection unit, to feed the generated quadrature error signal to said quadrature controller.

4. The demodulator as defined in claim 2 wherein

said quadrature controller comprises;

a first low-pass filter fed with said quadrature error signal output from said quadrature error detection unit to smooth out and output said quadrature error signal;

a first multiplier multiplying the quadrature component output from said quadrature detecting unit with an output of said first low-pass filter; and

a first adder adding the in-phase component output from said quadrature detecting unit and an output of said first multiplier;

the quadrature component output from said quadrature detecting unit being directly output, an output of said first adder being output as an in-phase component corrected for quadrature errors.

5. The demodulator as defined in claim 3 wherein

said quadrature controller comprises;

a first low-pass filter fed with said quadrature error signal output from said quadrature error detection unit to smooth out and output said quadrature error signal;

a first multiplier multiplying the quadrature component output from said quadrature detecting unit with an output of said first low-pass filter; and

a first adder adding the in-phase component output from said quadrature detecting unit and an output of said first multiplier;

the quadrature component output from said quadrature detecting unit being directly output, an output of said first adder being output as an in-phase component corrected for quadrature errors.

6. The demodulator as defined in claim 2 wherein said quadrature error detection unit comprises;

a second multiplier multiplying the in-phase component of the error signal (Ei) output from said quadrature detecting unit with the polarity signal (Dq) of the quadrature component of said demodulated signal;

a third multiplier multiplying the quadrature component of the error signal (Eq) output from said quadrature detecting unit with the polarity signal (Di) of the in-phase component of said demodulated signal; and

a second adder summing outputs of said second and third

multipliers;

an output signal of said second adder being output as said quadrature error signal (Qd).

7. The demodulator as defined in claim 3 wherein said quadrature error detection unit comprises;

a second multiplier multiplying the in-phase component of the error signal (Ei) output from said quadrature detecting unit with the polarity signal (Dq) of the quadrature component of said demodulated signal;

a third multiplier multiplying the quadrature component of the error signal (Eq) output from said quadrature detecting unit with the polarity signal (Di) of the in-phase component of said demodulated signal; and

a second adder summing outputs of said second and third multipliers,

an output signal of said second adder being output as said quadrature error signal (Qd).

8. The demodulator as defined in claim 2 wherein said automatic gain controller comprises;

a second low-pass filter smoothing out and outputting the in-phase component of the amplitude error signal output from said amplitude error detection unit;

a third low-pass filter smoothing out and outputting the quadrature component of the amplitude error signal output from said amplitude error detection unit;

a fourth multiplier multiplying the in-phase component output from said quadrature controller as an input signal with an in-phase component of the amplitude error signal smoothed out by said second low-pass filter, said fourth multiplier outputting the result of multiplication as the in-phase component of the demodulated signal; and

a fifth multiplier multiplying the quadrature component output from said quadrature controller as an input signal with a quadrature component of the amplitude error signal smoothed out by said third low-pass filter, said fifth multiplier outputting the result of multiplication as the quadrature component of the demodulated signal.

9. The demodulator as defined in claim 3 wherein said automatic gain controller comprises;

a first absolute value computing circuit determining an absolute value of the in-phase component output from said quadrature controller;

a second absolute value computing circuit determining an absolute value of the quadrature component output from said quadrature controller;

a third adder adding together outputs from the first and second absolute value computing circuits;

a fourth low pass filter smoothing out an output of the third adder;

a sixth multiplier multiplying an in-phase component

output from said quadrature controller with an output of the fourth low pass filter; and

wherein the quadrature component output from the quadrature controller is directly output as the quadrature component, and an output of the sixth multiplier is output as the in-phase component of the demodulated signal.